


Part II

Selected Presentation Slides, Given at the 59th Annual Center
Directors Meeting, Austin, Texas, October 30, 2001


II.7 University of Texas M.D. Anderson Cancer Center,
Science Park Research Division, Center for Research on
Environmental Disease

Presenter: Robin Fuchs-Young



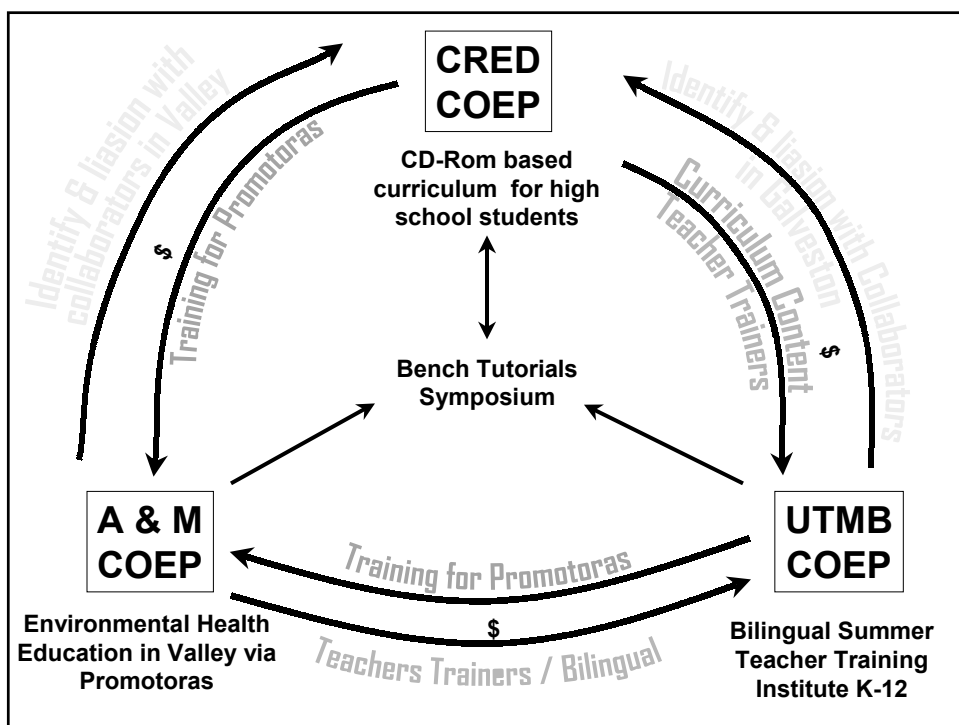
**Center for Research on
Environmental Disease**

**Community Outreach and
Education Program**



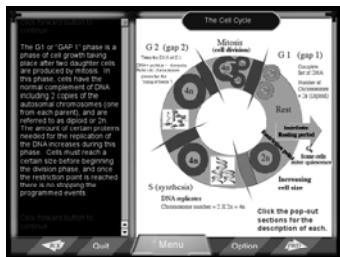
**CD-ROM based Environmental Health and
Science Curriculum Enhancement for
High School Students**

Robin Fuchs-Young, PhD., COEP Director
Ms. Christie Snodgrass, High School Science Teacher
Griffon Animations
Center Faculty and Facility core personnel



Center for Research on Environmental Disease

*From the bench to the public
Educating to prevent disease*



Goals for Curriculum Enhancement

To increase availability environmental
curriculum enrichment for high schools

Improve science and health education in our state

Provide information to enable students to make healthy
lifestyle choices

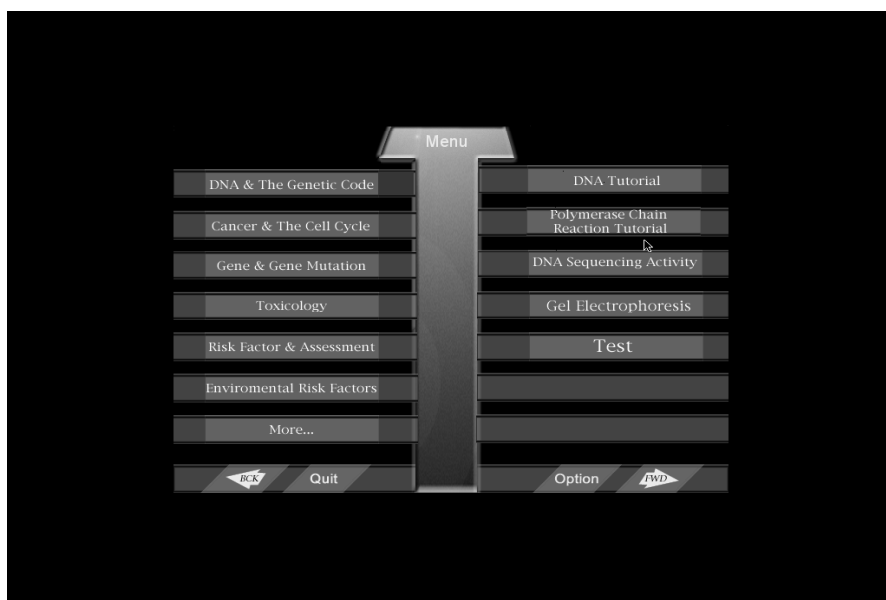
Assist teachers with concepts that they
may not be comfortable with

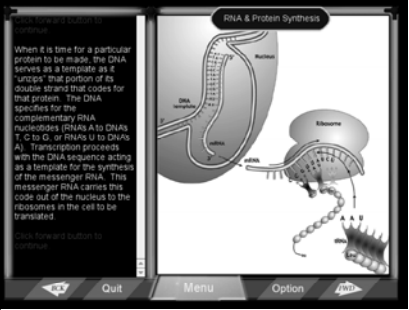
Methods

Teacher interns work at Center during summer

Design content based on lab experiences and interaction with
Center scientists

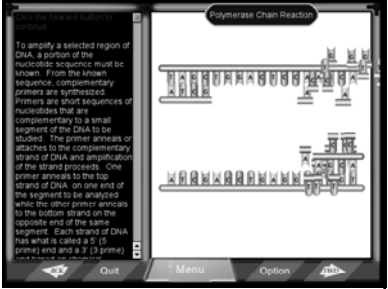
Main Menu





RNA & Protein Synthesis

When it is time for a particular protein to be made, the DNA serves as a template as it "unzips" that portion of its double strand that codes for that protein. The DNA specifies for the complementary RNA nucleotides (RNAs A to DNAs T, G to C, or RNAs U to DNAs A). Transcription proceeds with the DNA sequence acting as a template for the synthesis of the messenger RNA. This messenger RNA carries the code out of the nucleus to the ribosomes in the cell to be translated.




Polymerase Chain Reaction

To amplify a selected region of DNA, a portion of the nucleotide sequence must be known. From the known sequence, complementary primers are synthesized. Primers are short sequences of nucleotides that are complementary to a small segment of the DNA to be studied. The primer anneals or attaches to the complementary strand of DNA and amplification of the strand proceeds. One primer anneals to the top strand of DNA on one end of the segment to be analyzed while the other primer anneals to the bottom strand on the opposite end of the same segment. Each strand of DNA has what is called a 5' (5 prime) end and a 3' (3 prime) end.

DNA Module

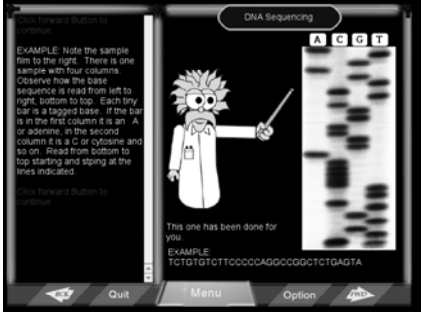
- Tutorial explains DNA replication/synthesis
- PCR tutorial
- DNA Sequencing activity
- Gel electrophoresis



Gel Electrophoresis

Gel electrophoresis refers to the migration of charged molecules through a matrix such as an agarose gel. The gel acts as a molecular sieve. Just as you can use a sieve in the kitchen to separate different sizes of granules of flour or sugar, scientists use a gel to separate different sizes, weights or shapes of molecules. An electric current is applied to drive the molecules through the gel.

A dye is mixed with the molecules to be studied. This enables the biologist to observe the progress of the electrophoresis. The gel is poured or "cast" so that there are sample reservoirs or "wells" at one end of the gel. The

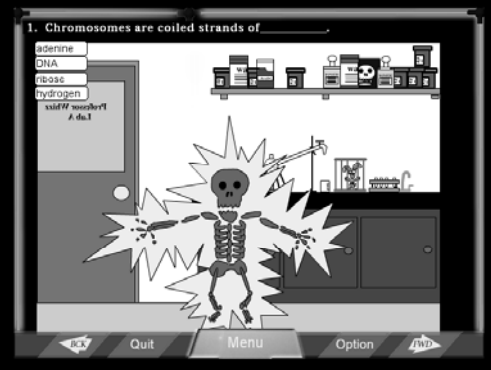


DNA Sequencing

EXAMPLE: Note the sample film to the right. There is one sample with four columns. Observe how the base sequence is read from left to right, bottom to top. Each tiny bar is a tagged base. If the bar is in the first column it is an A or adenine, in the second column it is a C or cytosine and so on. Read from bottom to top starting and stopping at the lines indicated.

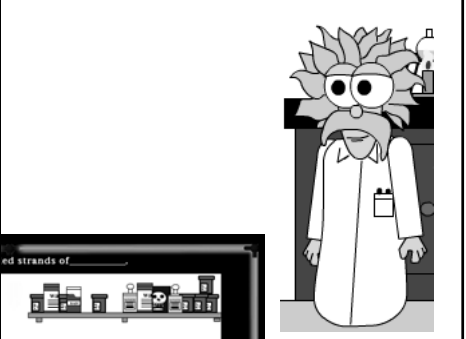
This one has been done for you.

EXAMPLE
TCTGTGCTCTCCGCCAGGCGGCTGTGAQTA




1. Chromosomes are coiled strands of

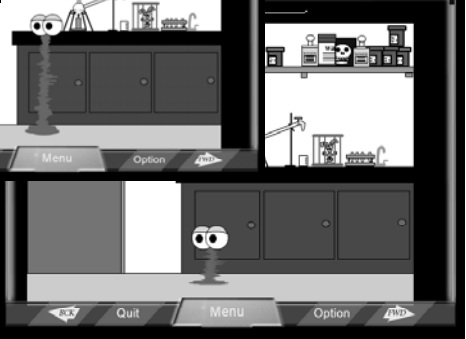
- adenine
- DNA
- ribose
- hydrogen
- nucleic acid



QUIZZES

At the end of each section & animated





Outcomes and Plans

Summer Institute Evaluation:	1	2	3	4	5
•Realization of workshop objectives					100%
•Appropriateness of content and activities			14%	86%	
•Effective use of technology			14%	14%	70%
•Value of quizzes for evaluating learning				14%	86%

Comments

- “useful for most of my classes”
- the module met my expectations “and more”
- “I expect a great product”
- “I really liked it and it is very useful in my class”

Next:

- Two workshops at CAST (Nov 1-3, 2001, Austin, TX)
- Pilot testing Galveston, Bastrop County, Austin & Brady
- Finalize and distribute
 - Maintain database of users and evaluation

